

OCCURRENCE OF POSTHYPNOTIC BEHAVIOR OUTSIDE THE EXPERIMENTAL SETTING¹

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17 excellent hypnotic Ss were asked to participate in a 2-day experiment which would involve many personality tests. On the 1st day Ss were given the suggestion that for the next 48 hr. they were to respond by touching their forehead each time they heard the word "experiment." The E tested the suggestion in the experimental setting, but unbeknownst to the Ss the critical test came in the waiting room: the secretary-receptionist tested Ss as they were leaving the building on the 1st day and again as they arrived on the following day. A quasi-control group simulating hypnosis was used to evaluate whether E may have unwittingly cued the Ss to respond outside of the experimental setting. The E was blind as to which Ss were excellent hypnotic Ss and which were essentially un hypnotizable simulators. Results showed that 5 hypnotic Ss responded consistently away from E; no simulating S showed comparable posthypnotic behavior (Fisher exact test, $p < .05$). Consistent posthypnotic response outside of the experimental setting was related to the level of hypnosis S achieved at the time the posthypnotic suggestion was administered.

Response to posthypnotic suggestion is one of the most striking of hypnotic phenomena. Subsequent to trance, subjects may still carry out suggestions which have been given to them in hypnosis. The posthypnotic response has been traditionally described as one which is largely outside of the subject's volitional control, is quasi-automatic, and is carried out compulsively (Erickson & Erickson, 1941; LeCron & Bordeaux, 1947; Weitzenhoffer, 1957).

This view of the posthypnotic response has been challenged by Fisher (1954, 1955). Fisher argued that posthypnotic behavior is not a quasi-automatic sequence of events elicited by a prearranged cue, but is dependent upon presentation of the cue in a particular type of setting. Posthypnotic behavior is carried out only in the specific context where the subject perceives that the hypnotist expects that it should occur. In one study

(Fisher, 1954), 13 hypnotized subjects were given the suggestion: "Every time you hear the word 'psychology' you will reach up and scratch your right ear." After the posthypnotic response had been elicited, the experimenter attempted, inconspicuously, to alter the experimental setting: an associate entered the room and an informal conversation ensued about the subject's responses. During this period the cue word was informally used and tested. Nine subjects who had previously responded to formal testing of the suggestion after trance failed to respond to the word used informally. Seven of these subjects responded again when the experimenter restructured the situation to intimate that the experiment was again in progress.

Data from Fisher's study have important implications for the controversy between role playing and state-oriented theoretical accounts of hypnosis. Fisher's study may be interpreted to support a role-playing view of the nature of hypnosis, such as that proposed by Sarbin (1950). If the hypnotic subject responds only in terms of the experimenter's expectations at the moment of testing, then posthypnotic behavior can be understood largely as a function of compliance, and should be limited to the experimental setting. Fisher's results seem inconsistent with the alternative theoretical position that hypnosis

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is an altered state of awareness which produces qualitative changes in the condition of the organism. Such a view would predict that posthypnotic behavior is not wholly dependent upon the context in which the suggestion is tested and may occur outside the experimental context.

There are several possible explanations for the failure of subjects to continue responding in Fisher's study (see Weitzenhoffer, 1957). In our view, however, the most plausible explanation arises from analysis of the suggestion that Fisher used. Taken literally, the suggestion to respond each time the word "psychology" is used asks the subject to respond indefinitely. The hypnotist ordinarily has no motive to give such a suggestion in an experimental context. Therefore, subjects could have inferred quite legitimately that the experimenter actually meant: "*As long as the experiment is in progress*, each time you hear the word 'psychology' you will reach up and scratch your right ear." If such a restriction to the experimental context was implicit in Fisher's suggestion, it is premature to conclude from his study that a posthypnotic response can be elicited only in that context.

The present study attempts to test whether the subject will carry out a posthypnotic suggestion in an extraexperimental setting when the suggestion is defined unambiguously for a definite period of time and the experimenter establishes a plausible motive for the suggestion by arranging to see the subject again before that time has expired. It aims to test the suggestion in an unrestricted context where the subject does not perceive that there will be any feedback to the hypnotist. Each subject was scheduled for two experimental sessions, 1 day apart. During the first session the subject was given the suggestion that for the next 48 hours he would touch his forehead with his hand every time he heard the word "experiment." This suggestion was legitimized by the fact that the subject was to be seen the next day. The experimenter who gave the suggestion tested it formally on both days, but the critical test was carried out by the secretary-receptionist who routinely received all subjects and paid them at the end of their experimental participation. The secretary casually tested subjects on the cue word as

they departed on the first day and as they arrived the next day for the second experimental session.

The real-simulating model (Orne, 1959, 1962) was used to evaluate whether the secretary's test was actually perceived by the subjects as one which was irrelevant to the experimenter's interests. The behavior of hypnotic subjects was compared with that of subjects who were instructed to fool a hypnotist into thinking that they were responding appropriately. In this model, simulators are not given any special training and have demonstrated previously that they cannot enter hypnosis. A variety of studies (Damaser, Shor, & Orne, 1963; Orne, 1959; Orne & Evans, 1965, 1966; Shor, 1962; Sutcliffe, 1961) have shown that simulators can duplicate most of the behavior of hypnotized individuals and cannot be detected in their simulation of hypnosis when tested by an experimenter who is blind as to their true identity.

In the present study, simulating subjects provide a rigorous test of whether or not the secretary was perceived by subjects as a surrogate of the experimenter. If subjects who are motivated to simulate the behavior of hypnotized individuals and who are hyper-alert to possible tricks and deception do not perceive that the secretary is part of the experiment, it is reasonable to assume that hypnotized subjects also would not perceive that the experimental context extended to the secretary. Under these circumstances the behavior of the hypnotic subjects can be interpreted at face value. Accordingly, if both groups respond to the cue word in the waiting room, no conclusion about the nature of the hypnotic situation can be drawn since the behavior of the simulating subjects indicates that the secretary's test may have been perceived by the hypnotic subjects as part of the experiment. If neither group responds, the secretary's test may be interpreted as one which is outside the experimental context, but posthypnotic behavior is limited to the experimental setting. It is only when hypnotic subjects respond to the secretary's test and simulating subjects do not, that the hypnotic subjects' behavior may be considered to extend to a context which is outside of the

experimental setting in which it originated.³

It is predicted, then, that if posthypnotic behavior is not limited to the experimental setting, hypnotic subjects who are capable of responding posthypnotically in the presence of the experimenter will also respond to the secretary's test away from the experimenter. A quasi-control group of subjects simulating hypnosis were employed to determine whether the waiting room test is perceived as extra-experimental or whether the experimenter's instructions are seen by subjects to include the waiting room setting as part of the experiment.

METHOD

Subjects

From a large sample of subjects who were tested on the Harvard Group Scale of Hypnotic Susceptibility, Form A (Shor & Orne, 1962), and the Stanford Hypnotic Susceptibility Scale, Form C (SHSS:C, Weitzenhoffer & Hilgard, 1962), 31 were selected for the study.

Fourteen male and three female student volunteers served as subjects in the hypnotic group. Their mean score on SHSS:C, prior to further individual training and evaluation, was 10.12 ± 1.65 . All subjects were rated by at least two independent, experienced investigators in separate sessions as attaining a score of -5 or higher on a 5-point clinical rating scale of trance depth (Orne & O'Connell, 1967). Subjects could readily achieve hypnotic trance, and were able to manifest deep hypnotic phenomena such as positive and negative hallucinations, age regression, post-hypnotic behavior, and amnesia.

Fourteen male student volunteers were selected to simulate hypnosis. Their mean score on SHSS:C was 1.79 ± 1.48 . These subjects were rated by two independent experimenters as showing minimum trance depth (-2 or lower) despite concentrated efforts to induce hypnosis.⁴

Procedure

Each subject had volunteered for a series of experiments. The subject was introduced to Experimenter 1 (FJE) who conducted a preliminary study which investigated the effect of motivating instructions on strength of grip. At the end of this study Experi-

menter 1 told all subjects that the next experiment would examine the effect of hypnosis on a variety of tests to be given on 2 successive days. Simulators were instructed additionally that they were to simulate hypnosis in the next study and behave just as they thought an excellent hypnotic subject would behave. Both during hypnosis and after awakening they were not to reveal that they were unaffected by hypnosis, and were to conceal the fact that they had not been hypnotized until they saw this investigator (FJE) after the experiment was completed. They were told (correctly) that Experimenter 2 knew that both real hypnotic subjects and simulators were participating in the study, but he was blind as to the true status of any individual subject; further they were told that Experimenter 2 would stop the experiment if he "caught on" that they were simulating, but that intelligent subjects had previously been successful at fooling experimenters.

On arrival for the present study, the subject was met by the secretary-receptionist in the waiting room.⁵ She established the legitimacy of her use of the posthypnotic cue by asking the subject if he knew for which *experiment*—the "dynograph," or the "psychology" one—he was scheduled. Upon checking the schedule sheet, she then informed the subject that he was in the "psychology experiment." The subject was then told he would be working with Experimenter 2 (PWS) who would be with him shortly. In fact Experimenter 2 did not know which of the subjects were real and which were simulators until after all subjects had been run by him.⁶ Experimenter 2 conducted the main experiment which consisted of two hypnotic sessions carried out within a 48-hour interval. All except two subjects were run on consecutive days.

First session. Experimenter 2 took the subject to the experimental room and generally defined the study as an investigation of the effect of hypnosis on a variety of tests which would be administered a number of times. The hypnotic induction and testing varied according to whatever the experimenter

⁵ The time between the two studies varied for subjects. Two subjects went on to the present study immediately, while others came back a month later. The average time between studies was 13 days. The variation in time between the two studies might be expected to affect the motivation of simulating subjects. Results, however, show that simulators were motivated very highly for their task of deception.

⁶ One hypnotic subject was not run blind by the experimenter, who recognized her name from comments he had heard about good hypnotic subjects who had worked previously with the laboratory. This subject was tested because of the difficulty in obtaining subjects who met the stringent selection standards for the study. The secretary also knew the grouping for some of the subjects. Ideally, she should have been entirely "blind." A change in personnel, however, may have alerted subjects' suspicions about why there was a departure from a familiar laboratory routine.

³ Studies have shown that simulating subjects have a higher index of suspicion than hypnotized subjects (Orne & Evans, 1966). Subjects who are asked to simulate become alerted to deception. This difference in populations makes the procedure a more stringent test. All other things being equal, simulators would be more likely than real subjects to surmise that the secretary is part of the experiment.

⁴ Two subjects had participated as simulators in other studies.

saw as most trance-inducing for the subject. Routine tests of hypnosis were given until the subject appeared deeply hypnotized. The posthypnotic suggestion was given late in the session prior to suggested amnesia for all trance events. It was intended to appear as a familiar suggestion to the subject who had experienced similar hypnotic procedures in the past. The subject was told that during the next 48 hours whenever he heard the word "experiment" his right hand would rise up to touch his forehead. The experimenter stressed that the response would occur so naturally that the subject would be unaware of it, and that it would occur automatically each and every time that he heard the word.⁷

After awakening the subject, the experimenter established that there was amnesia for the posthypnotic suggestion and asked him to listen carefully to the following stimuli: "chair," "desk," "hypnosis," "experiment," "personality," "soon I will want you to do some personality tests for me," and "this is a relaxing experiment to do." The experimenter recorded the subject's responses to the cue word in a conspicuous fashion. The obviousness of the experimenter's test made it a formal test of the posthypnotic suggestion. If there was no amnesia for the suggestion or if the subject failed to respond, the experimenter reinduced trance and delivered the appropriate suggestion again. A battery of personality tests was administered to complete the session, and the experimenter casually asked the subject to "check with the secretary on the way out about the time scheduled for tomorrow's session."

Critical test. The secretary met the subject and confirmed the time for which he was scheduled "to come for the next part of the *experiment*." Later she asked the subject whether it would be all right to pay him "now for today's *experiment* and for the next part of the study tomorrow." On arrival the following day she met the subject with the question: "Are you here for Dr. Sheehan's *experiment*?" The subject's responses to all three of the above uses of the cue word were observed by the secretary and were recorded by her after the subject had left the room. Because of the risk of arousing the subjects' suspicions, no arrangement could be made to have another person observe subjects' responses. Care was taken by the secretary to observe the subject in the absence of anyone who had previously hypnotized him. The subject's responses were not made known to Experimenter 2 until the experiment was complete for all subjects.

Second session. Experimenter 2 conducted the subject to the experimental room and informally tested the cue by saying to the subject as they walked along the corridor: "I am glad you could make this

part of the experiment today." When subject and experimenter were seated, the experimenter formally tested the subject on the list of words and sentences which he had heard the previous day. The subject was then put back into hypnosis, a deep trance was established, and instructions were given to induce an anxiety conflict for which the subject was given amnesia suggestions.⁸ The emphasis on the projective tests drew attention away from the posthypnotic testing of the cue word, which was the main purpose of the study. When the subject had completed the test battery, trance was reinduced and amnesia lifted. Before the posthypnotic suggestion was finally removed, the experimenter told the subject to remember that he had said "your hand would move up to your forehead whenever you heard the word 'experiment.'" Then the experimenter told the subject that he would no longer respond. This instruction offered a final test of the cue word when the subject had the clear expectation that the experimenter was about to remove the original suggestion.

Postexperimental inquiry. Experimenter 2 left the room after briefly quizzing subjects about their perceptions of the experiment. A comprehensive interview was then conducted by Experimenter 1 who had instructed the subjects initially. Subjective report was used to establish whether hypnotic subjects were in trance throughout the session and that the simulators experienced no trance effects. Further, subjects were asked for their comments on the experiment and their subjective reactions to the study.

RESULTS

If the subject raised either hand to touch his forehead when the cue word was mentioned, he was considered to have given a positive posthypnotic response. No subject failed to make at least one appropriate response in the presence of Experimenter 2 during testing on the first day. The most important tests were the three tests made by the secretary in the waiting room, which were designed not to be perceived by subjects as a part of the experiment. Two casual tests were also made by Experimenter 2: one was made in the corridor before the second session, and one as that session was obviously ending. The results of all these tests are presented in

⁸ Subjects were age regressed and told that they had stolen some money which they found in a purse on their way home from school. Routine tests of personality were given to subjects to measure the effects of conflict: Card 3BM of the TAT (Murray, 1938); a word association designed by Experimenter 2 to evoke responses related to the complex; a sentence completion test (Rotter & Rafferty, 1950); and a semantic differential test (Osgood, Suci, & Tannenbaum, 1957). Data from the study are reported elsewhere (Sheehan, in press).

⁷ A verbatim account of the posthypnotic suggestion has been deposited with the American Documentation Institute. Order Document No. 9987 from ADI Auxiliary Publications Project, Photoduplication Service, Library of Congress, Washington, D. C. 20540. Remit in advance \$1.25 for photocopies, or \$1.25 for microfilm, and make checks payable to: Chief, Photoduplication Service, Library of Congress.

TABLE 1
RESPONSES TO CASUAL TESTS OF THE POSTHYPNOTIC SUGGESTION^a

Type of test	Hypnotized (passed all) ^b <i>n</i> = 6	Hypnotized (failed some) <i>n</i> = 11	Simulating (passed all) <i>n</i> = 6	Simulating ^c (failed some) <i>n</i> = 7
By secretary in waiting room				
#1 (1st day)	4	1	0	3
#2 (1st day)	3	2	0	0
#3 (2nd day)	3	2	0	0
Both days #1 or #2, or both, and also #3	3	2	0	0
By E				
#4 (in corridor)	6	4	6	6
#5 (at conclusion)	0	2	1	2

^a Each entry represents the number of subjects in the given category making a positive response.

^b Subjects are separated on the basis of passing all, or failing at least one of the six criteria for good hypnotic performance. For specification of criteria, see text.

^c One intended simulator was excluded from the results. Although he received simulating instructions, he spontaneously decided not to simulate during the experiment itself and did not give responses characteristic of hypnosis.

Table 1. The subjects are separated into those who responded successfully to all suggestions given by the experimenter and those who failed to respond to at least one item. The specific performance criteria for this division were as follows: (a) the subject's amnesia for the first session held over the interval between sessions; (b) amnesia was complete for all trance events; (c) the subject gave the posthypnotic response on all formal testing occasions; (d) only one induction was necessary to establish the posthypnotic response in the first session; and (e) the subject passed every suggestion the experimenter gave in the first hypnotic session.

Table 1 indicates that no simulator responded in the waiting room on both days, but five hypnotic subjects did so. The association between presence of hypnosis and consistent waiting-room response was statistically significant (Fisher exact test, $p = .043$). The failure of simulators to respond consistently to the secretary's test indicates that the test was not perceived by subjects as part of the experiment. Evidence supports the hypothesis that posthypnotic suggestion *can* be effective in contexts which are not perceived by subjects as related to the experimental setting.

Results in Table 1 indicate that although no simulating subject responded to the *secretary* on the second day, all but one of them responded to the *experimenter's* informal test a few moments later. Their behavior was in marked contrast to that of the "real" subjects, many of whom failed the experimenter's

informal test. Table 2 reflects the significant differences between hypnotic and simulating subjects in response to the experimenter's informal test. Results indicate that the simulators were highly motivated to comply with the experimenter's demands, being even more alert than the hypnotic subjects to subtle and informal testing of the suggestion by the experimenter.

There was some degree of variation in the depth of trance hypnotic subjects achieved during the experiment. Eleven hypnotic subjects failed at least one of the experimenter's suggestions. Seven simulating subjects also failed to pass all of the performance criteria. Table 1 shows that compliance with the hypnotist's requests was associated with extra-experimental response for hypnotic subjects but not for simulating subjects. Five of the six hypnotic subjects who responded successfully to every suggestion responded in the waiting room at least once, and three of them did so on both days. The differences between these subjects and others in the hypnotic group were significant ($p < .05$) and are indi-

TABLE 2
NUMBERS OF HYPNOTIZED AND SIMULATING SUBJECTS WHO RESPONDED TO THE EXPERIMENTER'S "INFORMAL" TEST IN CORRIDOR

Informal response	Hypnotized	Simulating
Present	10	12
Absent	7	1

Note.— $p = .047$ (Fisher exact probability, one-tailed).

TABLE 3
NUMBERS OF "DEEPLY HYPNOTIZED" AND OTHER
HYPNOTIC SUBJECTS WHO RESPONDED AT
LEAST ONCE IN THE WAITING ROOM^a

Response in waiting room	"Deep"	"Less deep"
Present	5	3
Absent	1	8

Note.— $p = .043$ (Fisher exact probability, one-tailed).

^a "Deep" subjects are defined as those who passed all criteria of hypnotic performance set out in the text.

cated in Table 3. Results in this table suggest that for the hypnotic group extraexperimental responding was correlated with depth of trance.⁹ The fact that none of the simulators who passed every suggestion ever responded in the waiting room suggests that the association for the hypnotic subjects is causally related to factors other than the subject's desire to please the experimenter.

None of the "deep" subjects responded to the experimenter's casual test just prior to the removal of the suggestion, although all of them had responded to his informal use of the cue word earlier, in the corridor. It appears that the experimenter's demands had shifted so perceptibly at the end of the session that only three simulators (all of whom later expressed uncertainty about what had been expected of them) and two hypnotic subjects gave positive responses immediately prior to awakening. The finding is analogous to that found by Fisher (1954, 1955) and indicates that the subject's interpretation of the experimenter's implicit demands is an important determinant of hypnotic behavior, even among deeply hypnotized subjects.

The postexperimental interviews indicated

⁹ Although Experimenter 2 was "blind" about the subject's status in all but one instance (see Footnote 5), he formed an opinion in each case as to the subject's susceptibility and recorded it at the end of the first session. Analysis of ratings showed that the experimenter's perception of the subject's ability for trance was correct for all of the hypnotic subjects who responded in the waiting room. The experimenter's perception was not, however, the sole determinant of the subject's response, since two of the three simulators who responded initially in the waiting room were not perceived as good hypnotic subjects by the experimenter. The evidence indicates, however, that depth of trance may be confounded with the experimenter's conviction about the subject as a good hypnotic subject.

that two hypnotic subjects were aware of behaving oddly to some signal and thus may have perceived that the secretary was testing them. Both subjects, however, were inconsistent responders in the waiting room and had shown erratic responding in the presence of the experimenter. Five hypnotic subjects reported responding to the posthypnotic suggestion that night or the next day away from the laboratory. Their anecdotal reports provide clinical support for extraexperimental, posthypnotic responses.

Three simulators responded on the first day only. Two subjects thought that they may have been observed on the first day and so responded. Their initial reaction was one of mild paranoia—the feeling that they should respond in case someone might be watching—which subsided by the second day. Paradoxically, the third simulator who responded in the waiting room denied memory of the secretary using the word.¹⁰ Another simulator thought he may have been tested on the second day but realized it too late to respond.

DISCUSSION

Present findings support the hypothesis that posthypnotic behavior is not limited to the experimental setting. Hypnotized subjects responded posthypnotically in a situation perceived as unrelated to the experiment. They responded when leaving the laboratory and when arriving the next day for the second session. A group of simulators who were motivated to respond to whatever they thought was appropriate to the experimenter's requests failed to show comparable behavior. The two groups differed significantly in their response to the secretary's test. The differences in performance between the hypnotic subjects and the motivated group of simulators indicate that, for at least some hypnotic subjects, posthypnotic behavior cannot

¹⁰ It is possible that the response may have been genuinely posthypnotic. There was some evidence that this subject experienced trance effects during the first session. Since he had satisfied previous selection criteria and had attempted genuinely to simulate he was retained as a simulator in the analysis of results. Further discussion of the idiosyncrasies of subjects' responses and their clinical relevance is reported elsewhere (Sheehan & Orne, 1968).

be attributed to compliance or conscious role playing and is not wholly dependent on subjects' perceptions of the expectations of the hypnotist.

The data clarify the distinction between posthypnotic behavior and compliance. Taking the simulator's behavior as an example of compliance, it is clear that the compliant subject's response to a posthypnotic cue is limited only to situations where he feels that the experimenter will know about his behavior. His role is not interpreted as one which pertains to nonexperimental contexts. This is in contrast to the effect of the posthypnotic suggestion on good hypnotic subjects. A posthypnotic suggestion for these subjects may yield behavioral response outside of the experimental setting (in a context which subjects perceive as unrelated to the experimenter's interests).

A more desirable test of the present hypothesis would have been to investigate subjects' responses to the posthypnotic suggestion in a situation entirely removed from the laboratory setting. Unfortunately, reality considerations make a systematic study of this kind extremely difficult.

In the present experiment the secretary-receptionist unfortunately knew the true status of some subjects, and the possibility must be considered that her awareness may have unwittingly influenced subjects' behavior in the waiting room. However, results showed that a subject's tendency to respond posthypnotically outside the experimental setting was closely related to the depth of hypnosis he had attained at the time the suggestion was given. Five of the six subjects who successfully responded to all of the experimenter's suggestions during the experiment also responded on both days in the waiting room, whereas 8 of the 11 subjects who failed to respond to all of the experimenter's suggestions did not respond to the secretary's test at any time. While the secretary's awareness of the status of some of the subjects could conceivably have led to subtle differences in the use of cue word, she was deliberately not informed about the subjects' performance with Experimenter 2 until after all the subjects had been run. The strength of the relationship between the depth of hypno-

sis subjects achieved in the presence of the experimenter and their posthypnotic response to the secretary's test suggests that it is unlikely that subtle differences in the secretary's behavior were major determinants of subjects' responses.

In conclusion, it would seem that hypnotic subjects do not respond only when they think that the hypnotist expects that they should. The posthypnotic response can be influenced by the experimenter, and by the subject's expectations of what the experimenter wants, but it is also able to exist independently of the context in which it originates. This seems inconsistent with the view that the hypnotic subject is engaged in an interpersonal game with the hypnotist, and is playing a role in a quasi-conscious fashion. In some subjects, hypnosis is able to produce an enduring response which is automatically instigated by an appropriate signal. Results should be generalized with caution to the clinical setting where the person under hypnosis is known well by the hypnotist and where posthypnotic suggestions have strong personal relevance. Further parameters of the extraexperimental, posthypnotic response remain to be explored.

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